

# CALIFORNIA ENERGY COMMISSION

## Task 3

### **Marine Product Tanker Fundamentals, Economics & Outlook**

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# Agenda

- A. Historical product tanker movements
- B. Product tanker economics
- C. Domestic product tanker outlook



## A. Historical Product Tanker Movements

- o Logistics of USGC to California via Panama
- o Vessel trip time to California
- o Historical movements
- o California receiving facilities



## Logistics of USGC to California via Panama

- Accumulate cargo
- Load vessel
- Sail to Panama
- Wait for slot in canal
- Traverse canal
- Sail to Los Angeles  
or San Francisco
- Unload



## Loading

Activity	Hours
o Berthing	5
o Loading (Assuming 275 MBBLS @ 8 MBBLS/HR)	35
o Deberthing	5



## In Transit Time

<b>Activity</b>	<b>Hours</b>
o Gulf Coast to Panama Canal	120
o Waiting time for canal transition(average)	48
o (Current waiting time due to maintenance) (September 2001)	(96-192)
o Actual canal traverse time	8
o Panama Canal To Los Angeles	216
o Panama Canal To San Francisco	264



## Discharge Time

<b>Activity</b>	<b>Hours</b>
○ Time Waiting For Berth	12
○ Berthing	5
○ Discharging	35
○ Completion of Paperwork	5

<b>Total Voyage Time</b>	<b>Days</b>
○ Gulf Coast To Los Angeles	20.5
○ Gulf Coast to San Francisco	22.5



## Time Required for USGC to California via Panama (Summary)

<b>Activity</b>	<b>Hours</b>
Loading	45
In transit	392 to LA 440 to SF
Discharge	57
<hr/>	
Total hours	492 to LA 540 to SF
Total days	20.5 - 22.5



## Volume Analysis

$$\begin{aligned} &6 \text{ Ships} \times 275,000 \text{ Bbls per ship} \\ &= 1,650,000 \text{ Bbls} \end{aligned}$$

$$\begin{aligned} &1,650,000 \text{ Bbls} / 44 \text{ days} \\ &= 37,500 \text{ Bbls/day} \end{aligned}$$



# Historical Movements

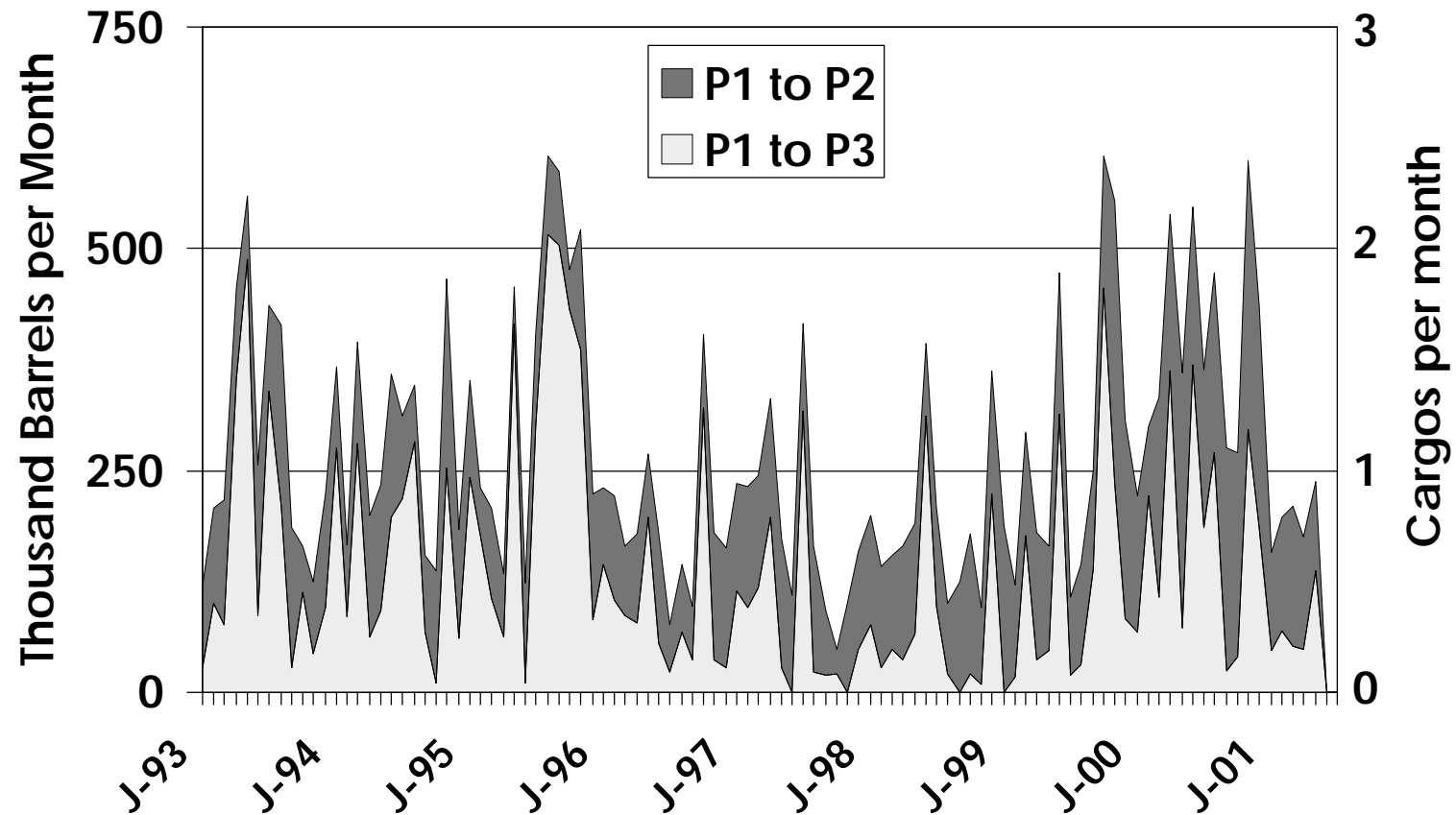
The following charts summarize  
waterborne movements from  
PADD to PADD

The greatest volume moves from  
the USGC to the Lower Atlantic States  
due to the lack of local refining  
capacity and product pipelines

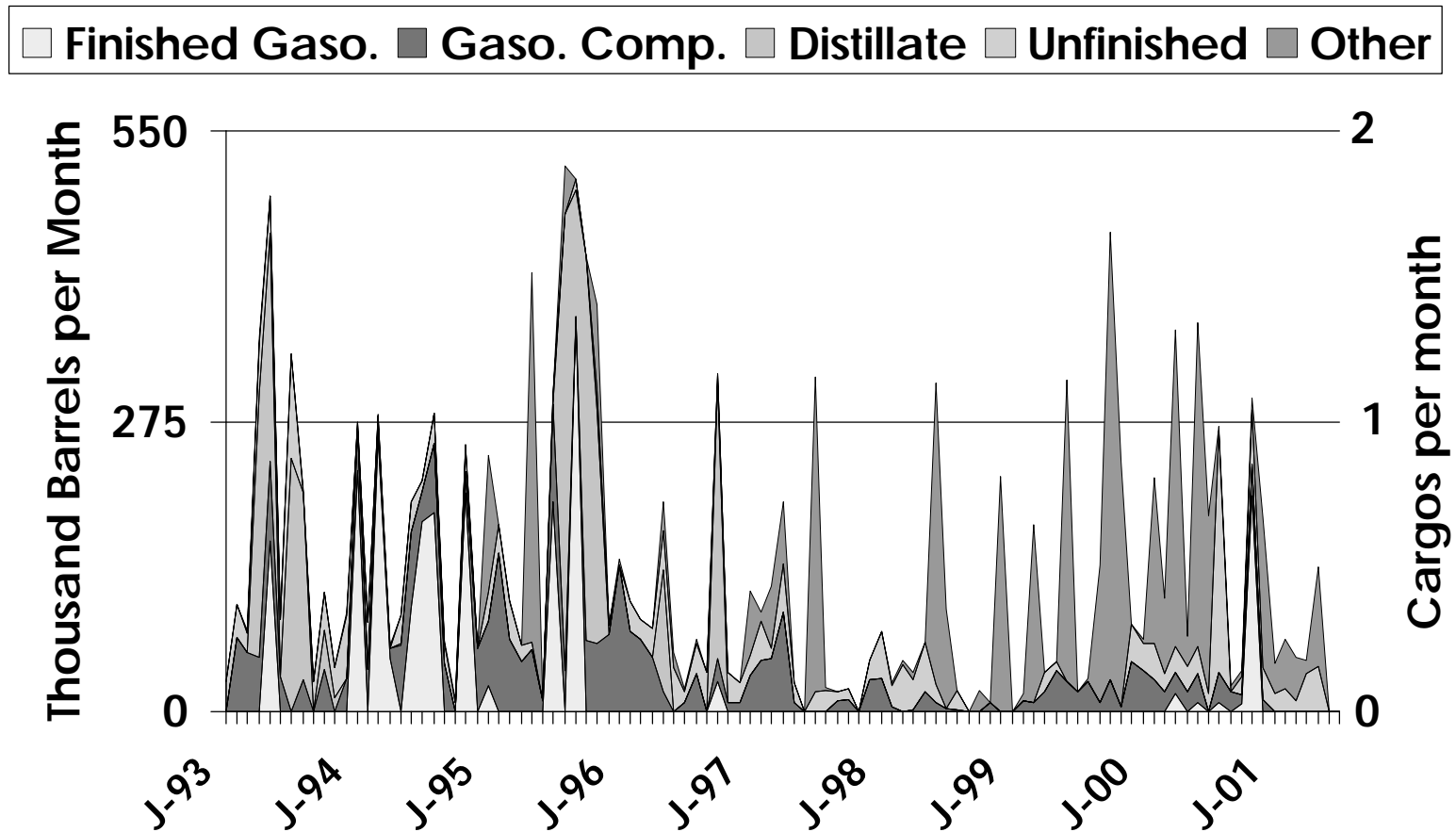
Ships must continue in this service



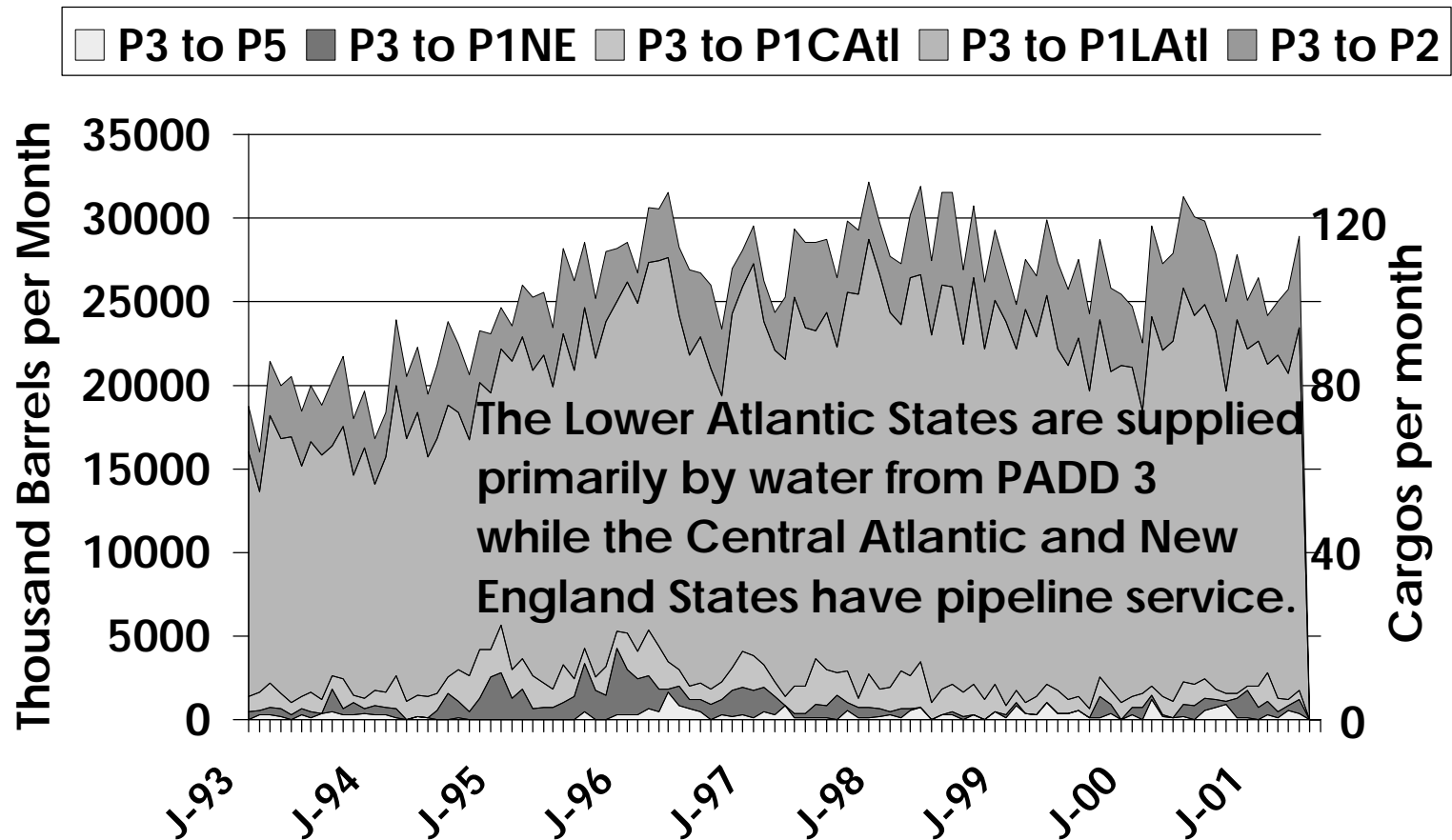
# Total PADD 1 to Other US via Water



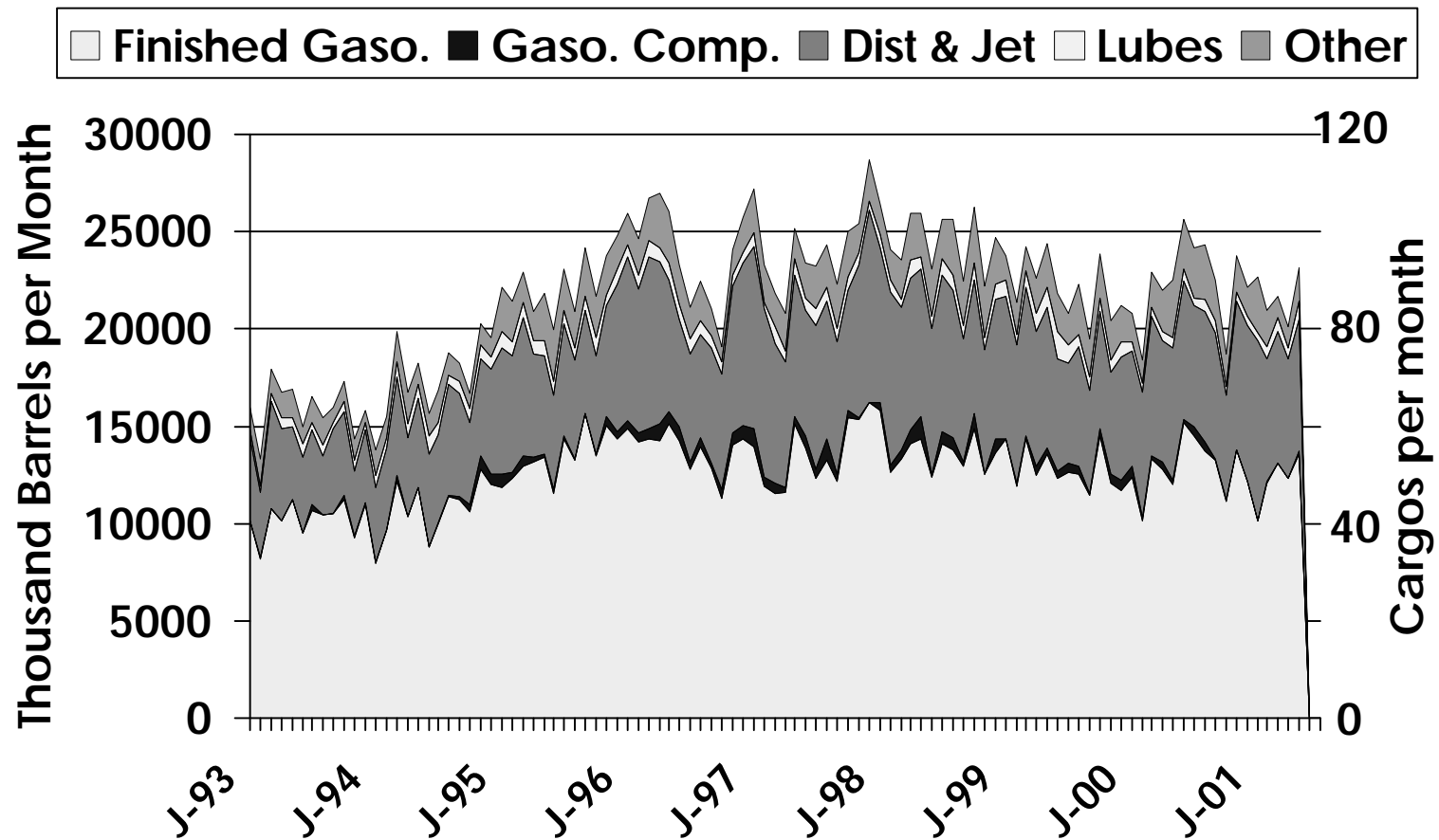
# PADD 1 to PADD 3 via Water (Not many backhauls available)



# Total PADD 3 to Other US via Water



# PADD 3 to PADD 1 via Water



## Florida & Southeast U.S. Product Demand

- Terminals in the Southeast are not well equipped to handle full cargo lots of a single finished product.
- U.S. vessels typically drop off product to multiple terminals or haul multiple grades of products to a single terminal.
- The lack of U.S. quality clean fuels from foreign sources inhibits the replacement of Southeast Florida product from foreign suppliers.



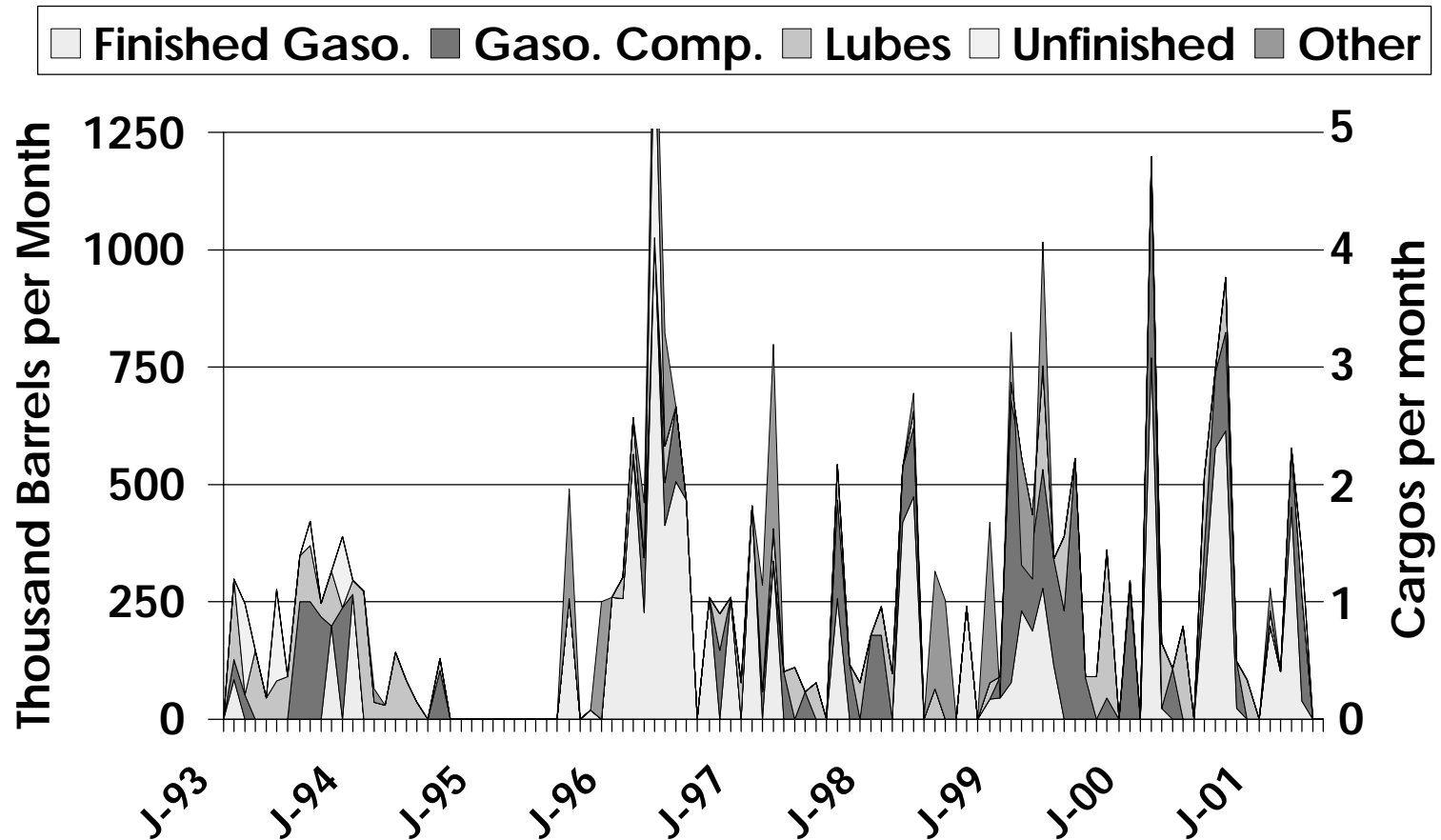
## Florida & Southeast U.S. Product Demand (cont'd)

- Products meeting U.S. specifications are not readily available to Southeast terminals from foreign sources.
- Most clean products must be shipped by vessel from the U.S. Gulf Coast.
- Ships cannot be reassigned to USGC USWC service.





# PADD 3 to PADD 5 via Water



Each P3 to P5 Trip = **FOUR** P3 to P1 Trips

**A vessel moving to Jacksonville from Houston will:**

Load	1.5 Days
Transit	4 Days
Discharge	1.5 Days
Return to Houston (Few backhauls)	<u>4 Days</u>

**Total 11 Days**

If a typical West Coast voyage is 44 Days  
this same vessel could have supplied  
**4 Voyages at ~ 275,000/Vessel = 1,100,000 Bbls**  
to Jacksonville in the same period of time.

# California Receiving Facilities

- Limited facilities to handle water-borne product
- Existing facilities mostly refiner-owned
- Small number of independent storage facilities in California
- Non-California sources reluctant to speculate on their ability to discharge cargo



## B. Product Tanker Economics

- Alternate supply voyage times
- US Jones Act vessel inventory



## Alternate Supply Voyage Times (Days)

- USGC to LA 18 + Canal
- Rotterdam 23 + Canal
- Sicily 25 + Canal
- Singapore 23
- Persian Gulf 35
- Canal requires:
  - **2** days waiting time
  - **0.33** days actual traverse time *but*
  - **Current wait is 4 to 8 days (Sept 2001)**

## Cargo Assembly Takes More Time (Days)

o Recognizing the need	1 - 7
o Finding the product	1 - 7
o Accumulating the product and waiting for ship	<u>1 -14</u>
o Total	2 -28

On average, add about **15** days to voyage times. Typically alternate supplies take **35** to **50** days to arrive.

## C. Domestic Product Tanker Outlook

- o Tankers under construction
- o Tankers retiring under OPA 90
- o New tanker economics
- o Will MTBE phase-out make more vessels available?



# US Jones Act Vessel Inventory

In a separate document I list:

- Ship name
- Ownership
- USCG designation number
- Cargo capacity (Tons and barrels)
- Age of vessel
- Draught
- Normal route or service
- Ability to convert from dirty to clean service

Several vessels in USG/USWC service are single hull and will retire under OPA90.



# Current U.S. Tanker Fleet (106 Ships)

## Origin:

- 103** Domestic-built  
(Including 3 under construction)
- 3** Foreign-built vessels

## Usage:

- 66** Product Carriers
- 40** Crude Carriers



## New Ship Construction

- Only two new ships are planned for construction through 2004
  - These ships are not planned to be in California or Gulf Coast service
- Only three ship yards are capable of building U.S. flag tankers
  1. San Diego
  2. New Orleans
  3. Philadelphia

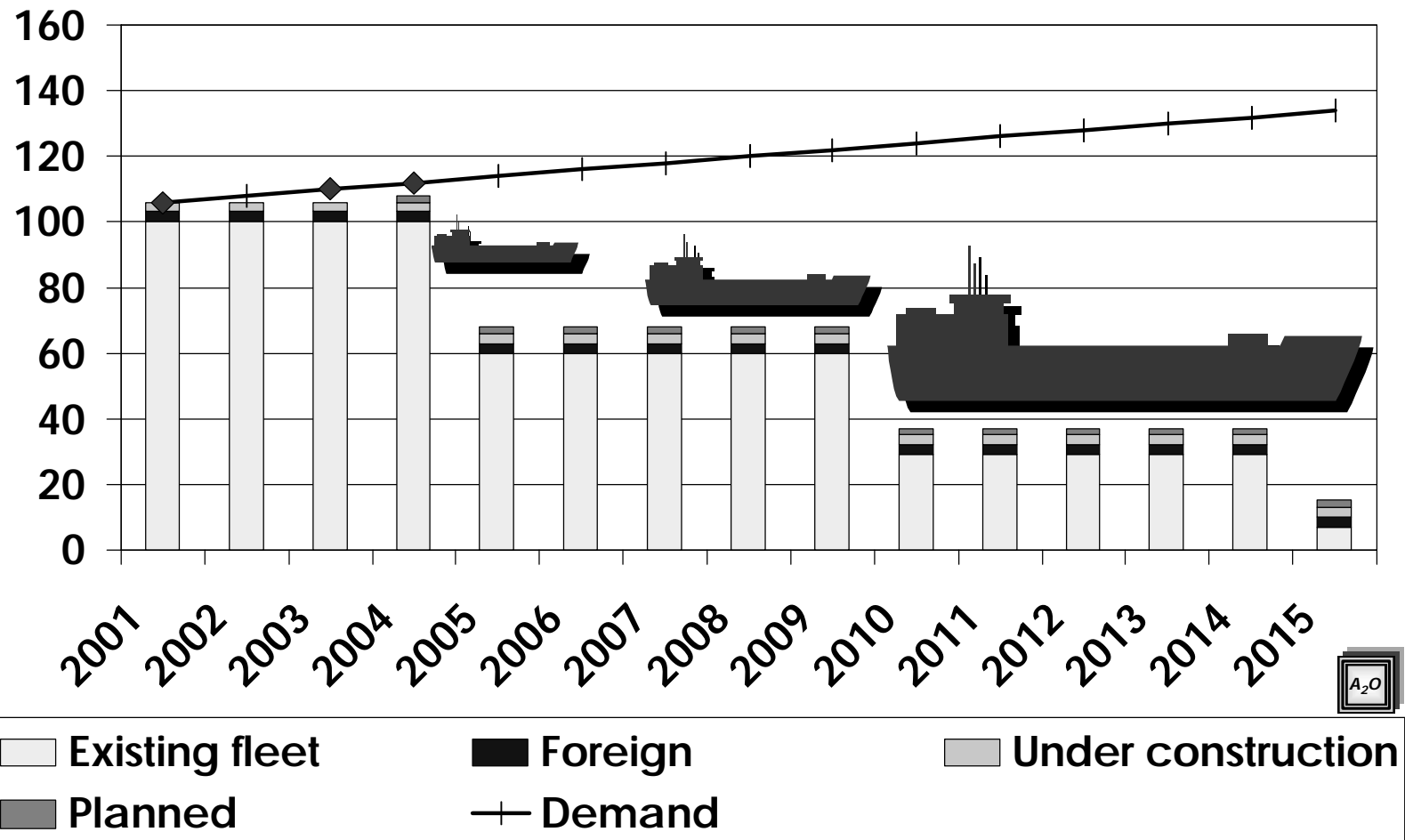


## OPA90 Retirement Schedule

OPA90 requires **93** tankers retire by 2015

- **13** vessels are OPA90 ***Exempt*** due to double hull construction built between 1998-2000
- **40** Vessels Will be Phased Out by **2005**
- **31** Vessels Will be Phased Out by **2010**
- **22** Vessels Will be Phased Out by **2015**

# Tanker Shortfall Created by OPA90



## New Ship Economics

- \$40-\$45,000/day lease rates needed to justify new ship
- Lead time is about 3 years
- Current rates (approximately \$35,000/day as of August 2001) are below the rate required to make ship building investment profitable



# New Ship Economics

(cont'd)

- o Potential pipelines make ship owners reluctant to build:
  - o Gulf Coast to West Coast pipeline
  - o Gulf Coast to Florida pipeline
- o The construction of either pipeline would idle existing ships and lower freight rates



## New Blue Water Barge Construction

- New construction of the larger 250,000 barrel blue water barges may be a viable economic alternative
- New blue water barges are capable of 12-13/knots per hour
- Construction costs will be considerably lower than a new vessel



## Current Blue Water Barges

### An Uneconomic Alternative

- o Blue water barges typically transport 150,000 Bbls of product at 10 -12 knots/hr
- o Typical U.S. flag ships move approximately 275,000 Bbls at 14 -15 knots/hr
- o California ship movements arrive **quicker** and at **less** cost than a blue water barge





# Blue Water Barges

(cont'd)

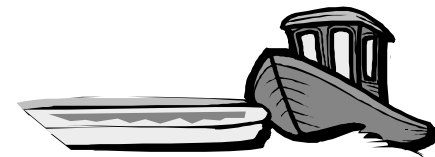
( Example of Barge Versus Ship  
Economics to the West Coast)

## o **Barge**

54 Days Transit Time

X \$18,000/Day =

\$972,000 / 150,000 Bbls



= \$6.48/Bbl

## o **Vessel**

44 Days Transit Time

X \$35,000/Days =

\$1,540,000 / 275,000 Bbls



= \$5.60/Bbl



## U.S. Flag Ship Demand

- While the cargoes are few, vacuum gas oil (VGO) and naphtha must move from the East Coast to the Gulf Coast
  - VGO is moved on clean U.S. tankers
  - Tankers are cleaned for back haul to East Coast
- Florida and U.S. Southeast markets (Lower Atlantic) must be served by vessel because there is no product pipeline



## U.S. Flag Ship Demand (cont'd)

- Ships fill the void when inland U.S. barge availability becomes tight
- U.S. flag ship availability is impacted by military demand
- Seasonally high demand for clean products on the East Coast can dramatically affect U.S. flag availability



## Jones Act Waiver

- Only during extreme short-term crisis
- Extended term not likely
- Jones Act support very strong
  - California Refiners
  - Unions
  - Ship Builders
  - U.S. Flag Ship Owners
  - Railroads
  - Environmentalists who will force OPA90 retirements



## Will MTBE Phase-out Make More Vessels Available?

- o The 4 MTBE/Ethanol vessels can not transport petroleum products
- o The vessels have other dedicated services
- o Many West Coast refiners will not allow ships older than 25 years to discharge in California



Let's Look at Two Cases:

Meeting California's needs with  
**NO** foreign supply

Meeting California's needs with  
**both** domestic and foreign supply



Case I California Requirements  
Worst Case Scenario- No Foreign Supply

- o California may be short 100,000 bbls/day of gasoline with an MTBE ban
- o Avg total voyage time for vessel is approximately 44 days
- o Avg volume of 275,000 bbls/vessel  
 $100,000 \times 44 \text{ days} = 4,400,000 \text{ bbls}$   
 $275,000 \text{ Bbls/Vessel} = \mathbf{16} \text{ Ships required}$

**THIS IS NOT POSSIBLE!**

## Case II California Requirements Best Case Scenario - Foreign Supply

- o Foreign flag vessels deliver CA grade gasoline & blendstocks
- o Vessels are available
- o Quality supply found in Canada, Caribbean & Europe but supply is limited
- o Producing California gasoline could dramatically reduce RFG production for other U.S. markets





## Case II California Requirements Best Case Scenario - Foreign Supply (cont'd)

- o Delivery time from most foreign sources to California would be greater than from U.S. Gulf Coast
  - o Time required to resolve supply problems would increase
  - o Term and magnitude of a "Price Spike" may increase

Foreign supply of gasoline to California  
is limited by supply/quality -  
**not** vessel availability

## Conclusions

- OPA90 retirements will create significant tanker **shortage**
- Vessels between USGC and Southern Atlantic states **must** be replaced
- Current tanker rates do **not** justify new construction
- California **must** rely on some foreign supply

